



**Clouds and the Earth's Radiant Energy System
(CERES)**

Summary Report of the First 14 Days of Operation

on the

Tropical Rainfall Measuring Mission (TRMM)

December 15, 1997

Summary

The CERES instrument, through day 14, has performed nominally with no unexpected instrument behavior. Function verification of most instrument subsystems has been completed and all operational sequences have been verified. Details of each day of operation are given below. Statements concerning anomalies and lessons learned are also given below.

Operational Time Line Details

The following describes the major activities performed for the CERES functional verification from launch through day 14.

Launch through day 5

The instrument was launched with survival power applied and was operated in this mode until day six. All temperatures were noted to be within expected ranges.

Day 6

CERES operational power was applied for the first time. The memory patches for the instrument were uploaded and the instrument was allowed to “warm up” before further operations. The instrument sensor temperatures were observed in the expected operational range after approximately 15 minutes. Other temperatures were observed during real time passes and were within the ranges for commencement of operations in approximately three orbits.

During the day, the instrument was commanded to uncage the azimuth gimbal brake and move to the crosstrack position. Several default parameters were reset in software and a memory dump was performed. The instrument was placed in the safe mode for the remainder of the day. Key parameters of the instrument were monitored during each pass.

It should be noted after application of operational power, the azimuth encoder did not experience the “rollover” that had been seen occasionally during I&T testing.

Day 7

This was the first day in which the azimuth gimbal was rotated through the entire range of motion. The instrument was commanded through several sequences which incrementally moved the azimuth gimbal to the operational position (first commanded to the discrete locations and later allowed to scan between locations). The elevation gimbal was also exercised in the various scan profiles which are used during operations. The functionality of the temperature controller for the science sensors was also verified. At the conclusion of testing, the instrument was placed in the crosstrack mode for the remainder of the day.

Special NOTE: During the day high resolution gimbal data was taken which, after analysis, showed no increase in friction for the azimuth gimbal operations as compared to prelaunch values.

Day 8

The instrument continued to operate primarily in the crosstrack mode. The first internal calibrations were performed in the crosstrack and biaxial modes. All calibration sequences executed as expected. Later analysis of the science data showed the offsets of the shortwave channel matched the offsets measured during ground testing. This is the primary channel calibrated using this sequence.

During this day it was observed the telemetry parameter for the main cover sensor number 1 occasionally oscillated and a bad sensor telemetry point was periodically recorded for sensor status. This type of response had been seen in thermal vacuum testing and is normal during periods of heating and cooling of the main cover. These events were correlated to solar events (sunrise, sunset) and the response to the limit conditions were noted for the Flight Operations Team.

Day 9

The instrument continued to operate primarily in the crosstrack mode. The solar calibration, contamination safe, and hold sequences were functionally verified. All temperatures and voltages continued to be within specification.

Day 10

During this day the instrument was operated primarily in the crosstrack mode. During a period of the day the instrument was operated in the biaxial mode and spacecraft stored solar avoidance commanding was verified. This verification occurred during a real time pass.

Day 11

The instrument operated in the crosstrack mode commanded entirely by stored spacecraft commands. An internal calibration was performed during the day.

Day 12

The instrument was operated in the biaxial mode with all solar avoidance commanding being issued by stored spacecraft commands.

Day 13-14

The instrument was operated in the crosstrack mode.

Anomalies

No unexpected instrument behavior was observed.

Lessons learned

Lessons learned during the checkout focused mainly on monitoring issues. These have been discussed with the Flight Operations Team.